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10/663,700	09/17/2003	Shinji Kimura	1288.43131X00	3969

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EXAMINER

WALTER, CRAIG E

ART UNIT PAPER NUMBER

2188

DATE MAILED: 08/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/663,700

Applicant(s)

KIMURA ET AL.

Examiner

Craig E. Walter

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 12 May 2006.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 September 2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date: _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Status of Claims

1. Claims 1-14, and 19 are pending in the Application.

Claims 1-14, and 19 have been amended.

Claims 15-18 have been canceled.

Claims 1-14, and 19 are rejected.

Response to Amendment

2. Applicant's amendments and arguments filed on 12 May 2006 in response to the office action mailed on 12 January 2006 have been fully considered, but are moot in view of the new ground(s) of rejection.

Claim Objections

3. Claims 1-2, 6, 9-10, and 12-13 objected to because of the following informalities:

As for claim 1, the phrase "to prohibit" recited in line 10 of this claim should be changed to "prohibits" for clarity.

As for claim 6, the phrase "data to requires the encrypting" as recited in line 8 of this claim should be changed to "data requires the encrypting" for clarity.

As for claims 9 and 13, the phrase "data is associated with data storage block" as recited in line 2 of both of these claim should be changed to "data is associated with a data storage block" for clarity.

As for claim 10, the phrase "error data notifies occurrence" as recited in line 2 of this claim should be changed to "error data notifies an occurrence" for clarity.

As for claim 12, the word "addition" as recited in line 3 of this claim should be changed to "additional".

Claim 2 is objected to for further inheriting the deficiencies of claim 1.

Examiner respectfully requests that Applicant correct any additional minor spelling and/or grammatical error that the Examiner may have overlooked.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 3, 4, 8, 9, 11-13, and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Arimilli et al. (US PG Publication 2003/0009640 A1), hereinafter Arimilli.

As for claim 1, Arimilli teaches a cache control method in a computer system that includes a storage device, a node device including a cache disk module for caching, and a client device connected mutually via a network (referring to Fig. 1, the system

includes a plurality of host/client nodes (12) which are connected via a network switch (15). Each node contains, *inter alia*, a memory (26) and a cache (22)), the cache control method comprising:

relating data processed in the computer system with attribute data which configures a caching operation of the cache disk module that caches the processed data on the network (referring to Fig. 4, the page table entry (PTE) stores, *inter alia*, a physical page number (98), a no intent to cache bit (110), and a node write through bit (108) – paragraphs 0046 through 0047, all lines. The latter two bits help the system to determine if the associated data should be cached, or not cached (i.e. written through to the memory) – paragraphs 0048 through 0049, all lines); and

mediating the processed data between the storage device and the client device via the network without the cache operation of the cache disk module when the attribute data prohibits the caching operation (data received by a node within the network is processed within the node based on the status of a plurality of write through indicators (when an indicator is set, the data is written back to the main memory rather than being cached – paragraph 0013, all lines). Note paragraphs 0025 through 0026, all lines, describe data sharing among the nodes and additional attached devices).

As for claim 3, Arimilli teaches a cache disk module for caching, and is connected to a storage device and a client device via a network, the node device comprising:

an obtaining unit that obtains attribute data related with data processed by the client device, wherein the attribute data configures a caching operation of the cache disk module that caches the processed data on the network (referring to Fig. 4, the page table entry (PTE) stores, *inter alia*, a physical page number (98), a no intent to cache bit (110), and a node write through bit (108) – paragraphs 0046 through 0047, all lines. The latter two bits help the CPU to determine if the associated data should be cached, or not cached (i.e. written through to the memory) – paragraphs 0048 through 0049, all lines); and

a mediating unit that mediates the processed data between the storage device and the client device via the network without the caching operation of the cache disk module when the attribute data prohibits the caching operation data received by a node within the network is processed within the node based on the status of a plurality of write through indicators (when an indicator is set, the data is written back to the main memory rather than being cached – paragraph 0013, all lines). Note paragraphs 0025 through 0026, all lines, describe data sharing among the nodes and additional attached devices.

As for claim 11, Arimilli teaches a storage device that is connected via a network to a client device, and a node device including a cache disk module for caching the storage device, comprising:

a storage unit for storing data processed by the client device (all nodes within the network contain a memory (Fig. 1, element 26), wherein the processed data is mediated between the client device and the storage device via the network (data is

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shared among each of the nodes within the network (paragraphs 0025 through 0026, all lines));

a relation unit that relates the processed data with attribute data which configures a caching operation of the cache disk module that cache the processed data on the network (referring to Fig. 4, the page table entry (PTE) stores, *inter alia*, a physical page number (98), a no intent to cache bit (110), and a node write through bit (108) – paragraphs 0046 through 0047, all lines. The latter two bits help the system to determine if the associated data should be cached, or not cached (i.e. written through to the memory) – paragraphs 0048 through 0049, all lines); and

a notification unit that notifies the node device of the attribute data related with the processed data (the CPU uses the indicators in order to inform the node whether the associated data is to be cached or not depending on the status of the bit – paragraph 0013, all lines) Note alternatively, the controller is capable of notifying the node device of the status of the attribute data (paragraphs 0049 through 0051, all lines).

As for claim 19, Arimilli teaches a computer readable recording medium in which a computer program is recorded, the computer program causing a computer to control operations of a node device that includes a cache disk module for caching, and is connected to a storage device and a client device via a network, the computer program when executed causes the node device to perform the functions of:

obtaining attribute data related with data processed by the client device, wherein the attribute data configures, a caching operation of the cache disk module that caches the processed data on the network (referring to Fig. 4, the page table entry

(PTE) stores, *inter alia*, a physical page number (98), a no intent to cache bit (110), and a node write through bit (108) – paragraphs 0046 through 0047, all lines. The latter two bits help the CPU to determine if the associated data should be cached, or not cached (i.e. written through to the memory) – paragraphs 0048 through 0049, all lines); and

mediating the processed data between the storage device and the client device via the network without the caching operation of the cache disk module when the attribute data prohibits the caching operation (data received by a node within the network is processed within the node based on the status of a plurality of write through indicators (when an indicator is set, the data is written back to the main memory rather than being cached – paragraph 0013, all lines). Note paragraphs 0025 through 0026, all lines, describe data sharing among the nodes and additional attached devices).

As for claim 4, Arimilli teaches the node device according to claim 3, further comprising:

A volatile memory for the caching, wherein the mediation unit mediates the processed data between the storage device and the client device via the network, by primarily using the volatile memory and secondarily using the cache disk module (referring to paragraph 0004, all lines, Arimilli teaches the use of volatile memory (i.e. RAM) as being used in a computer system for caching. Additionally note (referring to Fig. 1), Arimilli teaches each node as receiving data from the network via the node controller (16), at which point the data must traverse a path via one or more of the processing units (i.e. element 14) before it is stored in memory (26). In other words, the primary path is through the processing unit (containing the

cache). By default the data is stored within the cache unless caching indicators are set to indicate that the data is to be written directly through (without caching) to the system memory).

As for claim 8, Arimilli teaches the node device according to claim 3, wherein the attribute data is included in the processed data, and the obtaining unit obtains the attribute data from the processed data (paragraph 0048, all lines, the CPU sends the data along with the indicator to instruct the hierarchy not to hold the data in cache).

As for claims 9 and 13, Arimilli teaches the node (and storage) device according to claims 3 and 11 respectively, wherein the attribute data is associated with a data storage block of the storage device for storing the processed data (paragraphs 0046 through 0047, all lines, the no intent to cache and node write through fields are stored within each PTE entry, which stores each corresponding physical page number), and the obtaining unit obtains the associated attribute data from the storage device via the network in advance of mediation by the mediation unit (the CPU must obtain and process the indicator bits stored, then subsequently notify the node of the status before the mediation unit can determine if the data from the network is to be written to the cache or through to the system memory – paragraphs 0048 through 0049, all lines).

As for claim 12, Arimilli teaches the storage device according to claim 11, wherein the relation unit comprises:

an additional module that adds the attribute data to the processed data, and the added attribute data is mediated together with the processed data (paragraph

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0048, all lines, the CPU sends the data along with the indicator to instruct the hierarchy not to hold the data in the cache).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2, 5-7, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arimilli (US PG Publication 2003/0009640 A1) as applied to claims 1, 3, and 11, and in further view of Benantar (US PG Publication 2002/0144119 A1).

As for claims 2 and 5, though Arimilli teaches all of the limitations of claim 1, he fails to teach encrypting the processed data. Benantar however teaches network authentication processing via data encryption. More specifically, Benantar teaches encrypting processed network data via a public key (Fig. 6, element 606).

As for claim 6, though Arimilli fails to teach the limitations of this claim, Benantar however discloses an encryption obtaining unit that obtains encryption attribute data related with the processed data, wherein the encryption attribute data configures an encryption operation that encrypts the data (referring again to the flow chart illustrated by Fig. 6, an attribute certificate is generated based on the keys which are used to determine how the encryption process is to be carried out). Additionally, Benantar

teaches an encryption unit that encrypts the data when the encryption attribute data requires the encrypting operation (Fig. 6 demonstrates the flow of how the encryption process occurs based on generating the certificate from the public and private key data).

As for claim 7, though Arimilli fails to teach storing key data, Benantar discloses a volatile memory for storing key data used for generating the encrypted data (referring to Fig. 5, the keystore (518) is used to store the key data. Note paragraph 0031, all lines, the storage areas are described as either consisting of non-volatile or volatile memory).

As for claim 14, though Arimilli teaches all of the limitations of claim 11, he fails to the remaining limitations of this claim. Benantar however teaches a key management unit that manages key data used for encrypting the data cached in the cache disk module (Fig. 5, element 510 illustrates the SSO manager which manages the keys in the keystore (518) used to encrypt the data). Additionally, Benantar discloses a key notification module that notifies the node device of the managed key data (referring again to Fig. 6, the authentication information generated (which was based on the key information) is transmitted to the client to notify the client of the key information used to encrypt the data).

It would have been obvious to one of ordinary skill in the art at the time of the invention for Arimilli to further include Benantar's encryption system into his own NUMA data processing system. By doing so, Arimilli would benefit by having a means of protecting data within nodes from unauthorized access across his network system as taught by Benantar (paragraph 0004, all lines).

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arimilli (US PG Publication 2003/0009640 A1) as applied to claim 2 above, and in further view of Matsumoto (US Patent 5,737,522).

As for claim 10, though Arimilli teaches obtaining attribute data from the data processed within the network, he fails to teach notifying the occurrence of an error in the client device as claimed by Applicant. Matsumoto however teaches a serial I/O circuit with an automatic transfer function, which notifies the system if an error occurred in the data (col. 6, lines 6-56).

It would have been obvious to one of ordinary skill in the art at the time of the invention for Arimilli to further include Matsumoto's automatic transfer circuit into his own NUMA data processing system. By doing so, Arimilli would benefit by having a means notifying nodes within his network system of data errors. By exploiting Matsumoto's notification process, Arimilli could greatly reduce the amount of labor required to re-transfer the correct data as taught by Matsumoto in col. 5, line 54 through col. 6, line 3.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

8. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig E. Walter whose telephone number is (571) 272-8154. The examiner can normally be reached on 8:30a - 5:00p M-F.

10. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on (571) 272-4210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

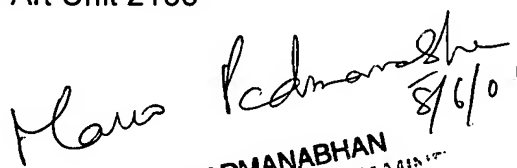
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11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Craig E Walter
Examiner
Art Unit 2188

CEW



8/6/06

MANO PADMANABHAN
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